

High performance at low temperatures – HPB Technology demonstrates outstanding winter suitability.

- New measurement results: even at -20 °C, the HPB Solid-State Battery still has over 90 % of the usable capacity that it has at room temperature (at a discharge rate of 1C). Stationary battery buffer storage systems or electric cars could therefore manage without external battery heating systems even in winter.
- HPB CEO Dr. Sebastian Heinz: “The outstanding low-temperature performance of the HPB Solid-State Battery is an essential prerequisite for real electric driving fun even in winter – in the car and at the charging station.”

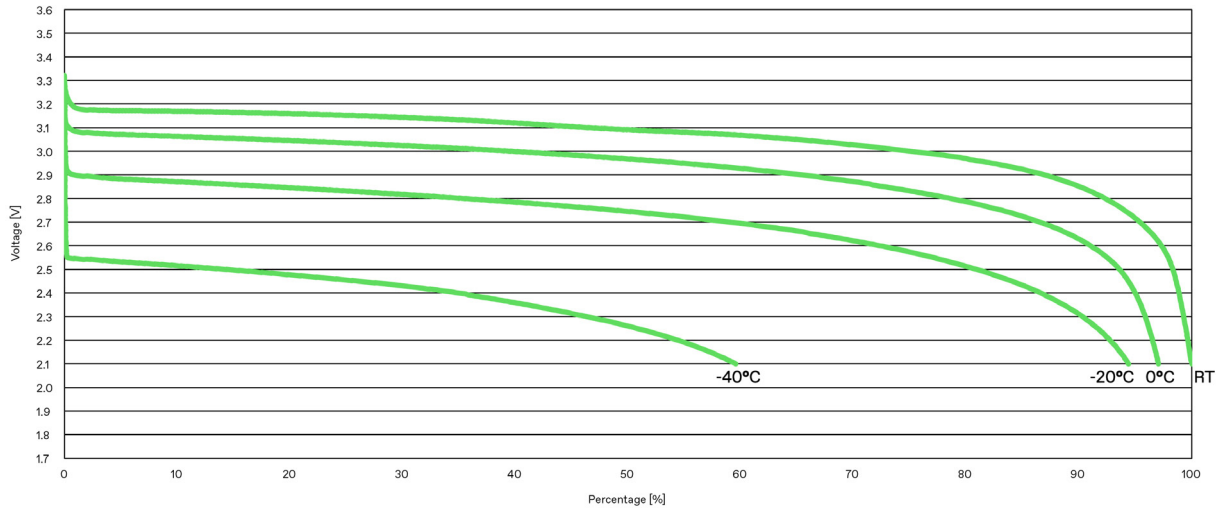
The latest test results show: The HPB Solid-State Battery demonstrates excellent performance even in extremely cold conditions. This enables applications that are inaccessible to conventional lithium-ion batteries or only accessible through the use of heating devices – a milestone in the development of battery cells.

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Battery storage systems are an indispensable key to the energy transition. However, the technologies available today quickly reach the limits of their performance when temperatures drop into the minus range. This is a major limitation for the use of batteries in electromobility as well as in stationary applications: because the sensitivity of batteries to cold requires additional effort in the form of heating and insulation, restricts possible locations (outdoor vs. indoor for stationary storage systems) or makes the use of battery storage systems completely impossible.

The HPB Solid-State Battery sets new standards in terms of the cold tolerance of batteries. Current measurement results show that an impressive proportion of its capacity can still be utilised even in extremely cold conditions – with a robust discharge rate of 1 C (complete discharge in just one hour).

Discharge Capacity [1C]



The diagram shows the latest measurement results for the discharge capacity of the HPB Solid-State Battery at room temperature (RT), 0 °C, -20 °C and -40 °C. It clearly shows that even at -20 °C the battery still has well over 90 % of the usable capacity that it has at room temperature.

This represents a considerable advantage over conventional batteries, which can only be operated at low temperatures either with a large loss of capacity or with an external heating system; or over batteries that are optimised for operation at low temperatures by means of additives, but which therefore have considerable disadvantages when operating at normal temperatures.

This was made possible by the patented HPB Solid-State Electrolyte. This can be formed directly in the cell using an innovative drop-in production process, which overcomes the problems of previous manufacturing processes for all-solid-state batteries and makes the HPB Solid-State Battery ready for series production today.

The practical importance of cold-tolerant batteries should not be underestimated, especially in the field of e-mobility. Cars, trucks, e-bikes and other mobile applications are directly exposed to outside temperatures. In many regions of the world, these can be very low for months at a time. However, the same applies to stationary batteries: While these have often been used in areas protected from the cold (e.g. as home storage units in the basements of residential buildings), their use in cold-sensitive areas provides a greater degree of freedom: batteries for the charging infrastructure or as buffer storage for wind power or solar systems are examples of this. In all these areas, cold resistance is a decisive advantage that makes the use of batteries more convenient, more economical or even possible in the first place.

Even at -40 °C, measurements of the discharge capacity of the HPB Solid-State Battery show that far more than half of the capacity can still be removed (approx. 60 % of the capacity at room temperature).

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About HPB

High Performance Battery Technology GmbH is a young company specialising in the research and development of a new generation of batteries with outstanding properties. The HPB Solid-State Battery is characterised by its non-flammability, extreme durability and significantly improved environmental properties – and is already ready for series production thanks to an innovative production process. HPB cooperates with renowned European plant engineering companies for industrial production.

High Performance Battery Technology GmbH, based in Bonn/DE, is a wholly owned subsidiary of High Performance Battery Holding AG, based in Teufen/CH, which is responsible for financing the research work: highperformancebattery.ch